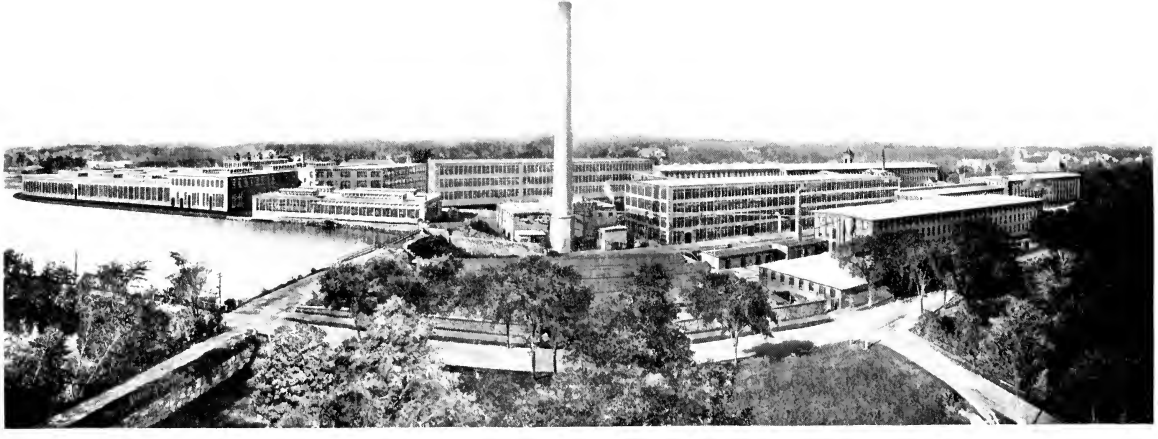
Cotton Weaving Machinery



The Whitin Machine Works, 1913

1913

Illustrated and Descriptive Catalog

OF

AND

Handbook of Useful Information

FOR

Overseers and Operators

Compiled by
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Issued by

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INTRODUCTORY

The mission of this catalog on **Cotton Weaving Machinery** is to call the attention of cloth manufacturers to the various looms and accessory machines built by us, thousands of which are now being used in many of the mills of this and foreign countries, where they have, by their superior construction and excellence in operation, proven their value. Having built looms for over sixty-five years, we have an experience possessed by very few in the trade, of the practical making and working of looms for weaving cotton goods of all kinds. This experience enables us to produce machines with the latest improvements, of the greatest durability, to produce the best work at the highest speeds with a minimum of cost in repairs and power required.

We build looms for weaving all kinds of cotton goods, among which may be mentioned: Sheetings, Shirtings, Drills, Twills, Satteens, Jeans, Ginghams, Fancy Dress Goods, Broad Sheetings, and Light and Heavy Duck, also looms for Worsted and Silk goods.

The machines illustrated and described on the following pages are our regular patterns for the production of the particular kinds of cloth which they were designed for. We will be pleased, however, to make such changes and additions as our customers may desire to answer their personal ideas and requirements in any of the orders they may choose to give us.

The rules and tables given, we hope, will be found useful by overseers and operators in their work in connection with our machines.

In addition to the machines herein described, we call the attention of cotton manufacturers to the other machines we build, namely: Cards, Sliver and Ribbon Lap Machines, Combers, Railway Heads, Drawing Frames, Fly Frames, Worsted Cone Roving Frames, Spinning and Twisting Frames, Spoolers, Reels, Quillers, and Special Textile Machinery. Descriptive circulars and catalogs of these machines may be had on application.

THE WHITIN MACHINE WORKS.

Whitinsville, Mass., April 1, 1913.

GENERAL
DIVISION OF CONTENTS

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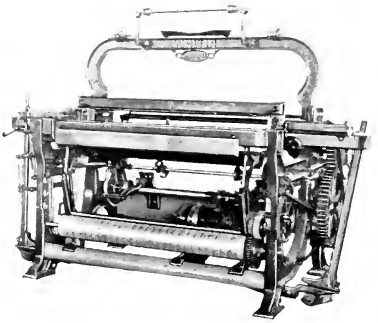
GENERAL DESCRIPTION OF WHITIN LOOMS

In designing these machines, careful attention has been given to securing rigidity, together with extreme accuracy as well as convenience of operations. Realizing the necessity of reducing the vibrations in the machines to a minimum, the metal in the **Frames** is distributed in proportion to the strength required and strains imposed. The girts and breast beams are preferably made of wood of large cross sections which prevents any undue vibrations, and at the same time allows an element of flexibility to exist which experienced weavers consider essential for the production of faultless goods.



The Lathes are made of the best of seasoned lumber and are fitted with either wood or iron race plates as preferred. The swords, of iron or wood, are supported in pockets held on a shaft journalled in bearings bolted to the loom sides. The reed cap is of hard wood and is fitted with an efficient shuttle guard.

The Shuttle Boxes, of either iron or wood, are made in several different styles to suit the varying conditions demanded by manufacturers. The shuttle boxes may be fitted with either front or back binders as preferred.

The Picking Motion is so designed as to give an easy pick on all kinds of weaves. The cams are provided with detachable chilled points which ensures long life to the cams. The pick shafts are of rugged design journalled in chilled cast-iron bearings firmly bolted to the loom sides. The well known Stearns' picker stick motion is applied unless otherwise ordered.

The Protecting Motion is of rugged design and is made to protect at both sides or in centre of lathe as ordered.

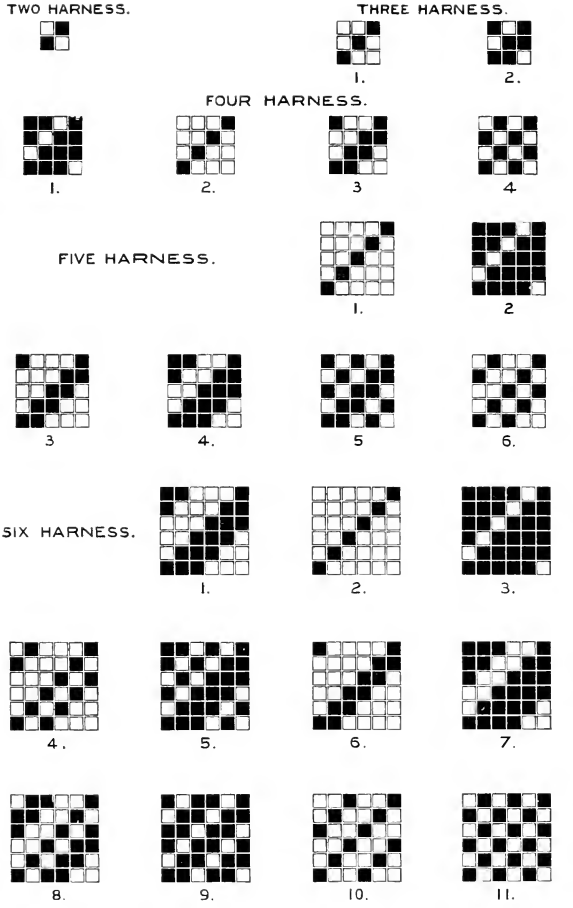
The Let-off Motion may be either the Bartlett or friction let-off, or a combination of both, but in addition to these we have several other styles of let-off motions that are applied when ordered. The whip rolls are made in various weights and sizes, either fixed, vibrating or revolving. The whip roll stands are readily adjusted to obtain the proper height of the yarn to give a satisfactory face on the cloth being woven.

The Take-up Motions are made in several different styles, winding the cloth into rolls from 8 inches to 22 inches in diameter, as ordered. The take-up roll may be covered with sand paper, perforated tin or steel filleting as desired. The pick gearing is generally arranged to make two picks for each tooth in the change gear, but to answer the requirements of manufacturers who may desire a different combination, we have other arrangements (see page 66), which will be furnished when so ordered.

The Harness Motions are so designed that the motion of the harnesses is free from jar, and consequently the warp is not subjected to any uneven strains. The cams are drawn out with mathematical precision, allowing proper time for the opening and closing of the shed for different widths of cloth and sizes of shuttles. Unless otherwise ordered our plain looms are made for 2 harness work, but they can be readily arranged for 3, 4, 5 or 6 harness satin or twill weaves, also combination weaves, the cams being set for any of the combinations shown on the following page. To facilitate the changing from one weave to another, our looms may be equipped with a short auxiliary cam shaft on which the cams are fixed, but are easily removable for any required change. Weavers who have been called upon to make changes in twill work can readily appreciate the advantages of this construction.

We have two **Selvage Motions,** the plain, and the tape styles. They are simple in construction and efficient in their action.

Our Standard Warp Beam is 16½ inches in diameter, but we can furnish looms equipped for any size beam from 12 inches to 20 inches diameter, either for gear or friction let-offs. **Our patented** Beam Lock is furnished when desired. By the use of this device the beam is held securely in its bearings with no possibility of it



Harness Designs

getting loose, but when desired the beam is easily unlocked by a simple twist of the hand, requiring neither hammer nor wrench, as in old methods.

Filling Stop-Motions are furnished with all looms, any style of fork being fitted as ordered.

Our Improved Warp Stop Motion, supplied when specified, is a decided improvement over our old style, both in its simplicity, and also its adaptability to old as well as new looms. The construction is so designed as to combine strength and rigidity with lightness, thus reducing breakage to a minimum, and at the same time rendering the mechanism not too cumbersome in its application to the loom.

Beam Lock

The motion can be used with any number of harnesses, there being a detector or drop for each thread. In case of a breakage of a thread its detector falls into the path of the vibrating feeler, whose motion is thus arrested, resulting by means of a suitable connection with the loom shipping mechanism in stopping the loom.

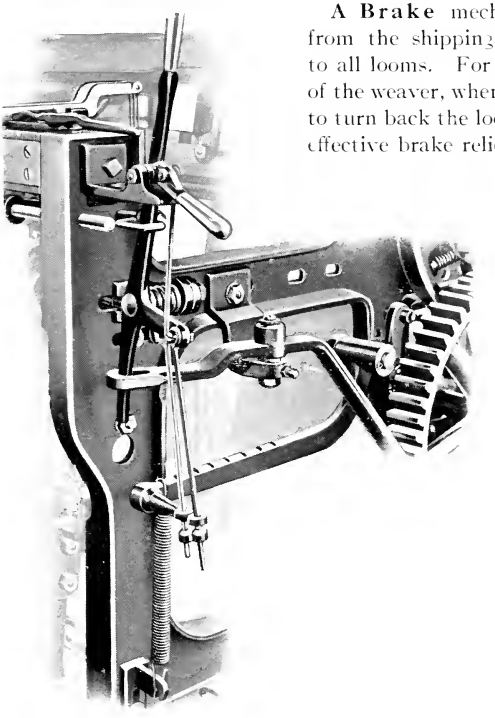
Owing to the extreme lightness and superior finish of the detectors used in this motion, chafing of the yarn is reduced to a minimum.

The Driving Pulleys may be either the "tight and loose" style, plain, compounded or friction as preferred. To render the friction drive more positive, cork "inserts" may be used.

The Driving Gearing on crank and cam shafts may be placed at either the pulley or foot ends as desired. They are of large pitch and broad face, thus ensuring strength and maximum freedom from wear.

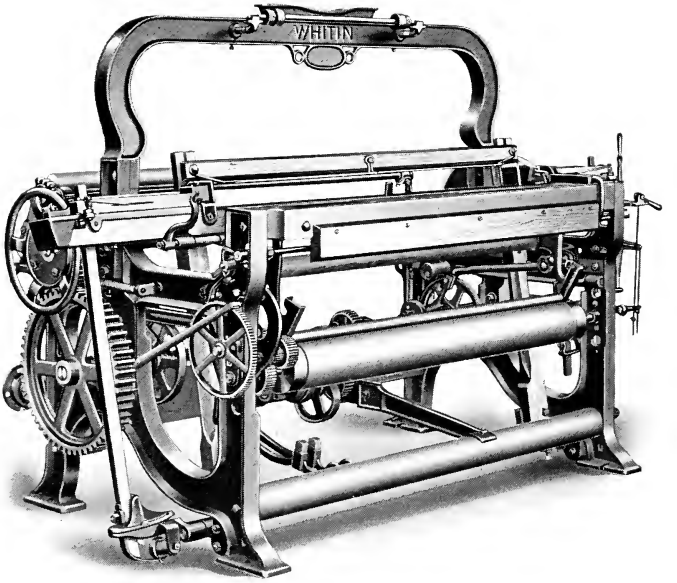
The Crank Shafts are dropped forgings of the best of material. This, together with the cam shafts, which have especially large

diameters, are most carefully machined and fitted, assuring long life and smooth running. The shaft bearings are of generous proportions, and so designed that the shafts may be removed with the least amount of labor.



A Brake mechanism actuated from the shipping lever is applied to all looms. For the convenience of the weaver, whenever it is desired to turn back the loom, a simple and effective brake relief is provided.

Brake Relief



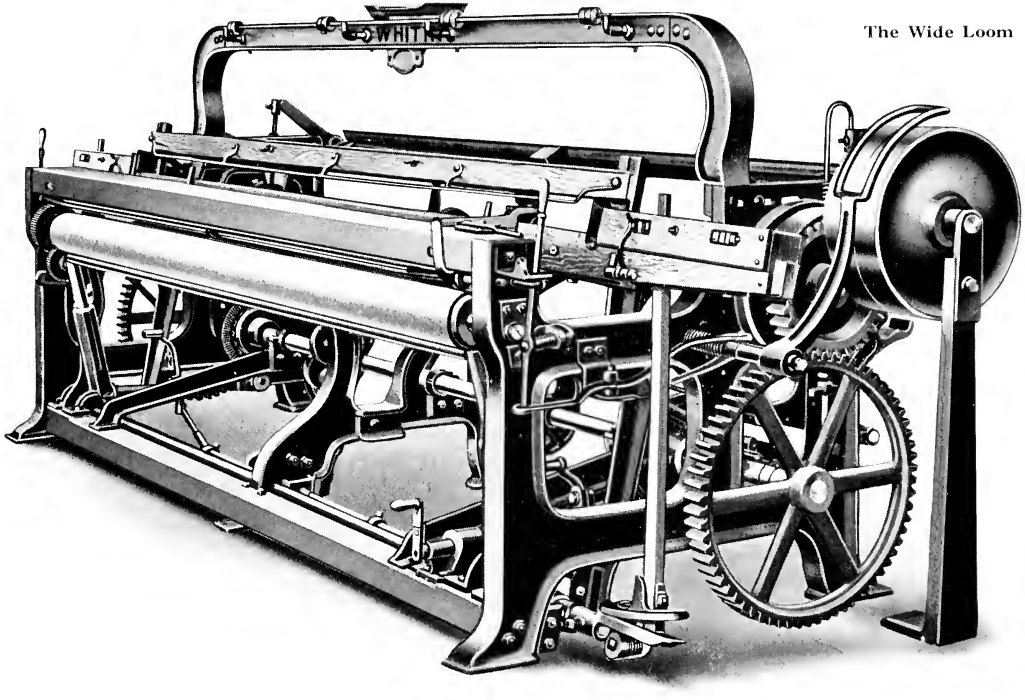
Heavy Pattern Loom

HEAVY PATTERN LOOM

Designed for Standard Sheetings, Shirtings, Drills, Twills, etc.

This loom is made in two sizes, viz.: Standard and Ponemah. The latter has three inches greater harness space. The framing of this style of loom is very heavy, and is admirably adapted for the high speeds and large production demanded in weaving the class of goods for which the loom is designed. When desired, this loom is made with an adjustable arch, by means of which extra harness space may be obtained.

As will be seen from the illustration, this loom is regularly fitted with our standard **Cam Harness Motion**, which may be readily arranged for 2, 3, 4, 5 or 6 shed work; Side Shaft Tappet Ball Shuttle Motion; Brake on driving pulleys; Radius of crank: 2″, 2¼″, 2½″, 2¾″ and 3″. Cut-roll stands for either 8″, 12″, 16″, 18″ and 22″ diameter cut-rolls. Bartlett geared let-off motion or friction let-off. Shuttle boxes 18″ to 24″ long. Beam heads 12″, 13″, 14″, 15″, 16″, 16½″, 18¼″ and 22″ diameters. Either plain or tape selvage motion if desired. Pulleys: Tight and loose, or friction as desired; diameters 10″ to 15″ by 2″ face.


WHITIN

THE WIDE LOOM

Designed for Wide Goods, either Plain, Drill or Twill

This loom is made for weaving goods from 72″ to 150″ wide. The general construction is of an exceptionally heavy character. It is fitted with a geared driving device, thus ensuring steady running under a light driving belt.

The torsion in the loom is reduced to a minimum by having the cam and crank shafts geared together at both ends.

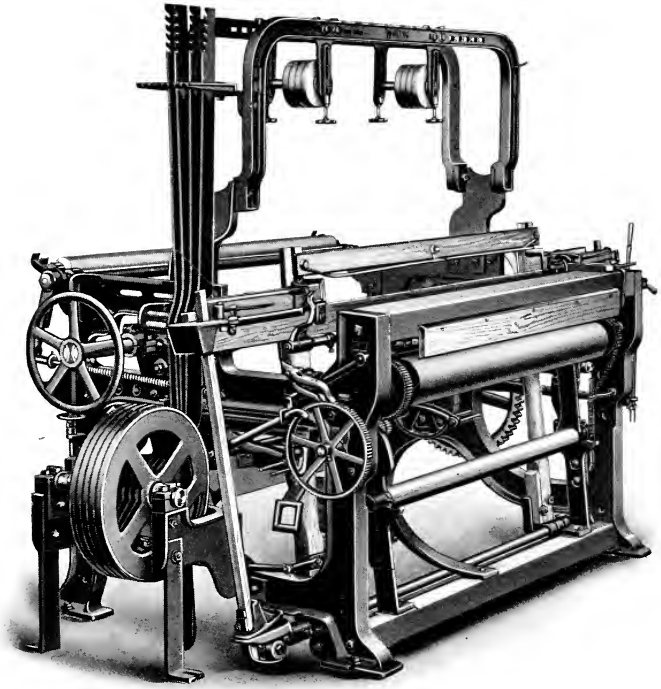
The **Pick Motion** is the well-known scroll type with adjustable cams.

One or more warp beams from 12″ to 16½″ in diameter may be used. When two beams are used, an even tension is maintained on the yarn from the beams to the cloth by means of a compound let-off motion.

The **Shuttle Boxes** are from 20″ to 24″ long.

The loom is usually fitted with our patented **High-Cloth-Roll Motion** as shown in the illustration; but, if preferred, our old style 12″ cloth roll motion may be had instead.

Pulleys: Tight and loose, 15″, 16″ and 17″ diameters by 3″ face.



End-Cam Loom

END-CAM LOOM

For weaving Heavy Sheetings, Drills, Twills, Jeans Satinets, etc.

This loom is built especially heavy to withstand the severe strains due to weaving this class of goods.

The movements of the harnesses are positive, due to the peculiar **Harness Motion,** consisting of cams and jacks, of capacity of two to eight harnesses. Owing to the location of the harness mechanism outside of the frame, cams are readily changed when different weaves are required.

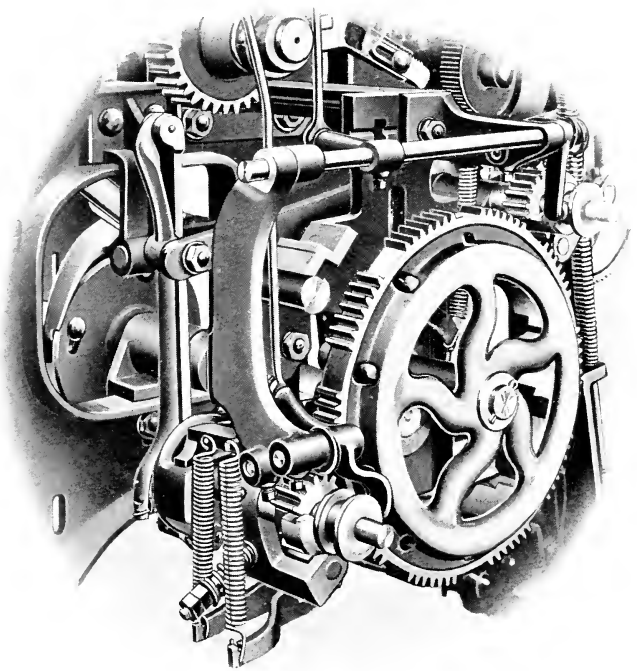
The loom may be fitted with either a friction or Bartlett let-off; high-cloth-roll motion, such as shown in illustration, or, if preferred, our patented high-cloth-motion shown in illustration on page 34. Beam locks and friction driving pulleys if desired.

Beam Heads: $16\frac{1}{2}$″ diameter.

Pulleys: 10″ to 15″ diameter, 2″ face.

FANCY LOOMS

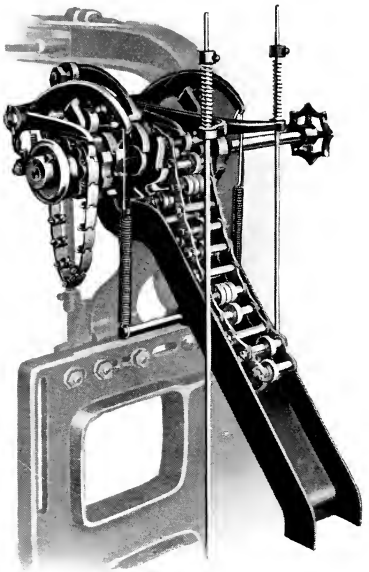
Under the name of fancy looms we include all looms for weaving cotton dress goods, ginghams, plaids, stripes, lenos, handkerchiefs, etc. Our facilities for meeting the requirements of manufacturers of this class of goods is shown in the machines illustrated and described on the following pages.



Drop-Box Mechanism

Our Fancy Looms are fitted with either a drop-box motion or dobby or a combination of both to answer the particular requirements of the goods proposed to be woven.

The well-known **Crompton Box Motion** of two, four or six boxes into one is used. The shuttle boxes are carried positively into their correct positions by means of sliding gears and eccentrics combined with lifting levers, motion being imparted to the sliding gears by a mutilated gear actuated from the cam shaft. The changing of the boxes is accomplished through a wire connection between the sliding gears and pattern chain mechanism. A break-down motion is provided to prevent any injury to the shuttle boxes or drop-box mechanism due to a picker sticking or a shuttle failing to enter a box.

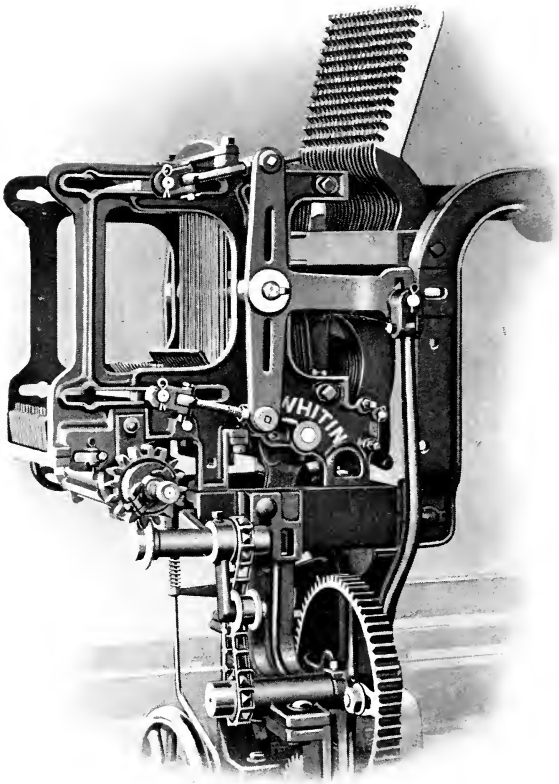


Drop-Box Pattern Chain and Multiplier

The Pattern Chain mechanism for indicating the drop-box mechanism is supported on a bracket fastened to the loom side, and is driven from a cam on the cam shaft, through a break-down lever and connecting rod.

A Multiplier attachment may be applied to the pattern chain mechanism whereby a large number of picks of one color may be woven into the cloth without the necessity of using a long and cumbersome pattern chain.

The Whitin Dobby has several features which commend themselves to the manufacturers of fancy cotton and silk goods. The



Dobby

sides are of a substantial as well as of pleasing design. They are rigidly held together by cross ties whose ends being milled to length ensures an accurate spacing between the sides for the indicating fingers, jack and harness levers. The top and bottom hook racks are made of malleable iron which reduces the breakage of these parts to a minimum. The top rack being made in two parts facilitates the removal of the top and bottom hooks, jack levers and lifting wires.

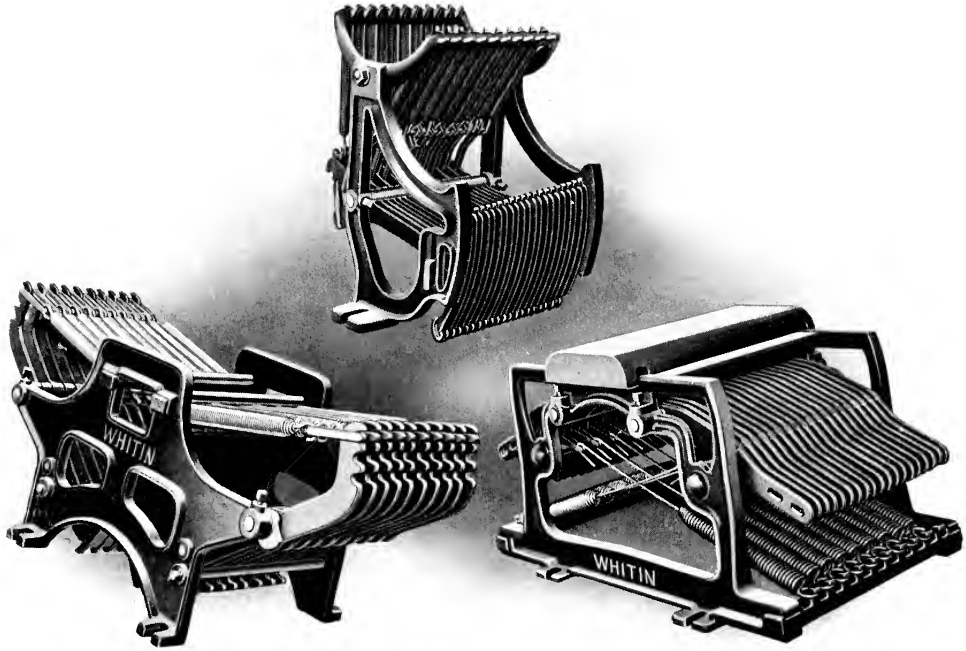
By means of the **Angular Shedding Device,** the harness levers are raised on an angle to conform to the angle of the shed, thus ensuring the correct amount of lift to each harness without undue strain on the warp. This is accomplished by the unequal travel of the opposite ends of the lifting knives in combination with an inclined back stop on the top cross tie for the jack levers. The harness levers are of such length as to guarantee a clear shed for all sizes of shuttles. The lifting knives are connected to the rocker arms by wrought-iron eye-bars with swivel adjusting joints of generous dimensions, thus ensuring freedom from wear and tending to prolong the life of the dobby. Soiling of the yarn or cloth by oil dropping from the lifting knives bearings and connections is prevented by a drip pan secured to the dobby side.

A Harness Levelling Device of simple and effective nature is provided.

We make two types of dobbies, viz.: **Single** and **Double Index,** capacities ranging from 8 to 30 harnesses. They can be applied not only to the various patterns of Whitin looms, but also to looms of any other make.

The Single Index Dobby has but one row of pegs in each bar of the pattern chain, and one set of indicator fingers. Each finger indicates on both a top and bottom hook.

The Double Index Dobby has two rows of pegs in each bar of the pattern chain and two sets of indicator fingers. One row of pegs indicates for the top set of hooks, the other row for the bottom set. The chief advantage the double index dobby has over the single index is that with the former, one bar of the pattern chain serves for two picks of the loom, while with the latter, one bar serves for only one pick, therefore the double index dobby is more desirable for weaving long patterns, as it requires only half as many bars of



No. 1

No. 2

Spring Jacks

No. 3

chain as would be necessary to weave the same pattern on a single index dobby.

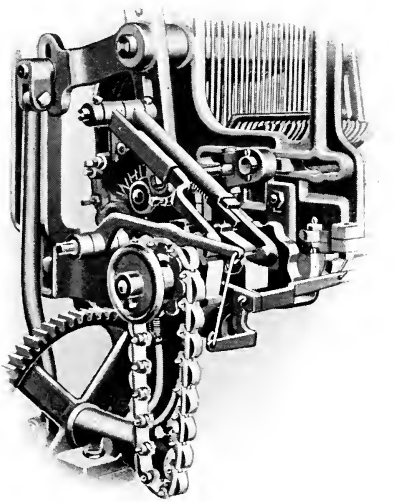
Motion is imparted to the dobby rocker-arm either from the crank or cam shaft of the loom, as ordered, the transmitting mechanism being so situated that there is no chance of oil spattering on the warp. The pattern chain cylinder may be driven by gearing from the crank shaft or by ratchet actuated from rocker arm as preferred.

For pulling the harnesses down, we furnish coiled springs attached to cast-iron holders fastened to the floor, or, if so ordered, either of the three types of **Spring Jacks** illustrated on page 28 may be had instead.

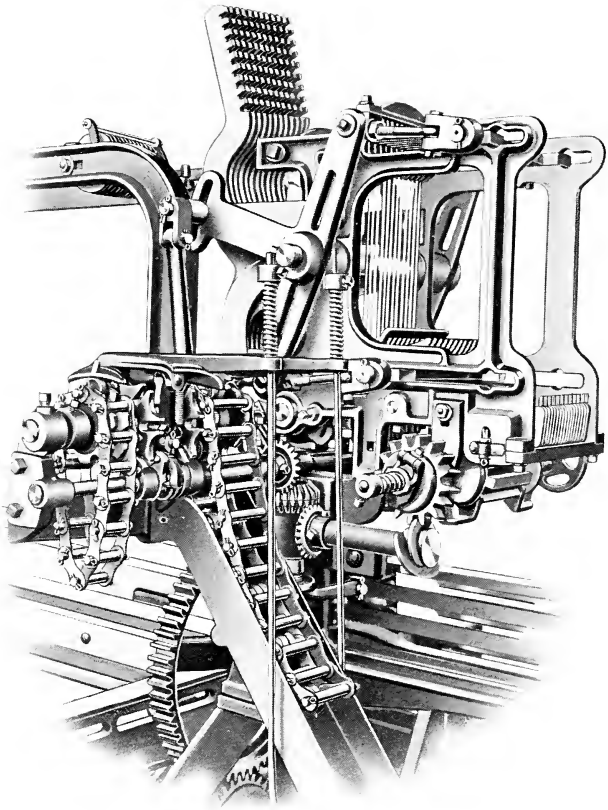
A simple and effective **Multiplier** for producing cross bar effects, handkerchiefs and the like, may be easily applied to our double index dobby.

Our Patented Jumper Motion applied to a dobby in combination with beams and yarn slackeners makes a very satisfactory arrangement for weaving **Leno** effects.

In looms fitted with both dobby and drop-box mechanisms, both pattern chains can be moved in unison from the front of the loom whenever it is necessary to turn the pattern mechanism back to match the pick in the pattern being woven. This construction prevents the possibility of a break in the pattern being woven, as there is no chance of the pattern chains getting out of time with each other.

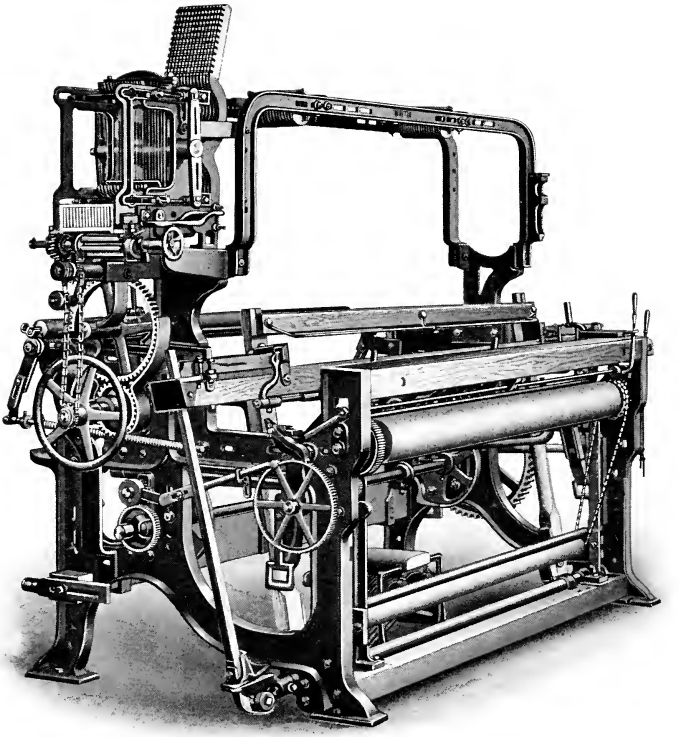


Dobby Multiplier



Pattern Controlling Mechanism

On the following pages we illustrate and briefly describe some of our principal types of fancy looms.



Dobby Loom

DOBBY LOOM

We make several types of plain **dobby looms** for weaving various kinds of fancy cotton goods. Although similar in general construction they differ in harness capacity, single or double index dobbies, multiplier or leno attachments, cloth roll and take-up motions.

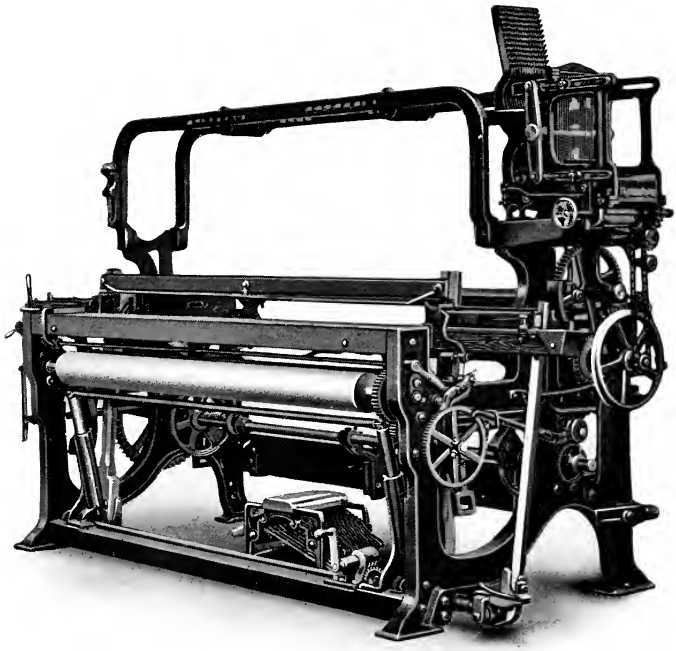
The loom, illustrated on the preceding page, is admirably adapted for weaving fine or coarse fancy goods. Special attention is called to its heavy construction and well protected gearing, thus preventing accidents to the weaver.

The dobby, as shown, is of the single index style, with worm drive for the pattern chain cylinder and a gear drive for the rocker-arm. A double index dobby may be had if desired.

A frictional chain wind **cloth roll** driving mechanism, in combination with a high sand roll, is used in combination with a take-up motion, which is easily arranged to take up every pick or alternately, as desired.

Optional attachments: Bartlett or friction let-off; tight and loose or friction driving pulleys; dobby chain multiplier; leno motion with slackener bars; top beams and stands; beam locks; warp stop-motion; spring jacks.

Pulleys: 12″ or 14″ diameter by 2″ face.

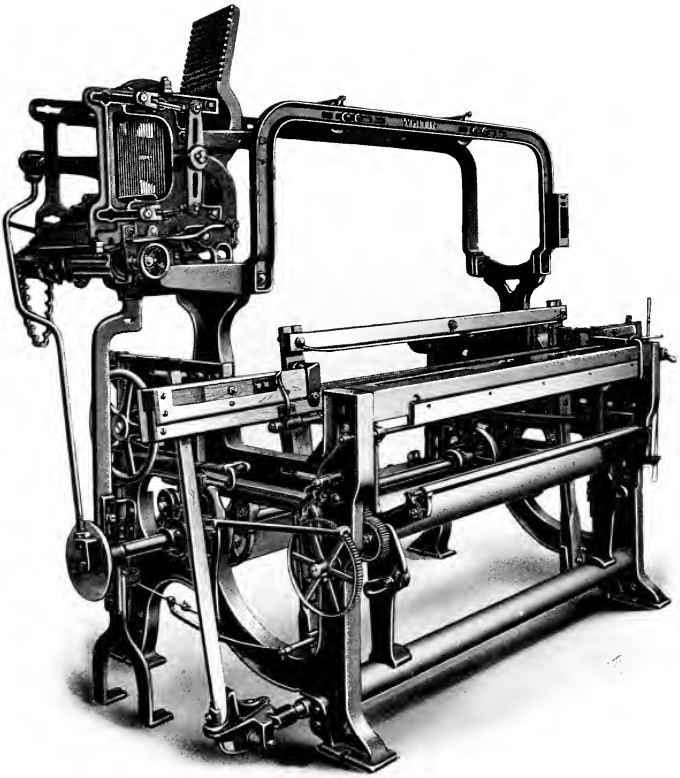


Dobby Loom

DOBBY LOOM

On the preceding page is shown another type of dobby loom, which is similar in all respects to that shown on page 32, excepting the **cloth-roll motion.** This motion is patented, several thousand having been made, and are giving satisfaction to their users. It consists of a sand roll $4\frac{1}{2}''$ diameter, placed a short distance below the breast beam, and a cloth roll, held in movable bearings, pressed against the sand roll by compression springs, which exert a constantly increasing pressure as the roll of cloth increases in diameter. By the use of this arrangement access to the inside workings of the loom is easily had, and in addition wrinkling of the cloth, as it is being wound, is avoided to a great extent. A roll of cloth 12 to 13 inches in diameter may be made. The removal of the roll of cloth is easily accomplished, and may be done while the loom is in operation, by means of a worm, a few turns of which depress the cloth roll holders so that the pressure is removed and the roll of cloth may be removed and a new roll started.

Pulleys: 12″ or 14″ diameter by 2″ face.



Dobby Loom

DOBBY LOOM

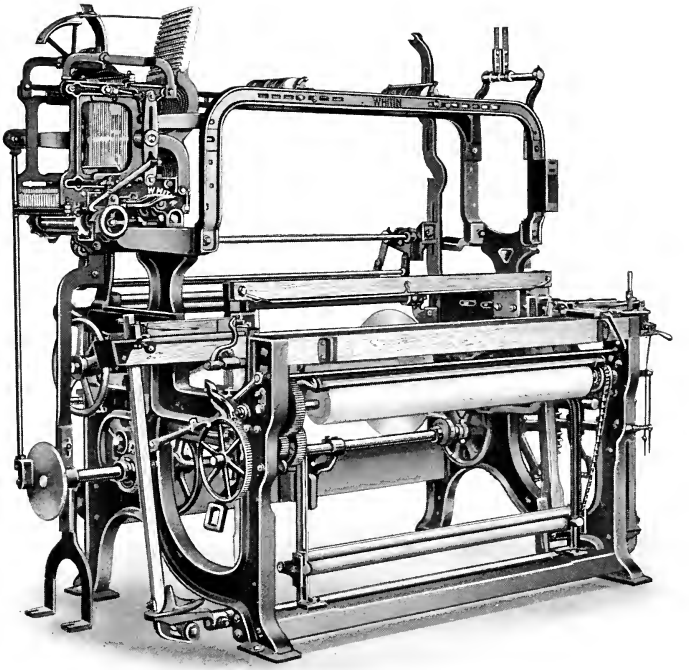
The loom illustrated on the preceding page shows our ordinary style of loom, fitted with a dobby, whose rocker-arms are actuated from the loom cam shaft. This is a very desirable method of driving, owing to its simplicity, ease of adjustment and freedom from the danger of oil soiling the warp.

The **Dobby Pattern Chain** mechanism is fitted with a multiplier which renders the loom admirably adapted for weaving handkerchiefs and like goods.

The **Cloth-Roll** motion shown in the illustration is especially popular on account of its simplicity, ease of operation and sensitiveness to the take-up pull-back motion. It is designed to wind a roll of cloth eight inches in diameter.

Optional Attachments: Bartlett or friction let-off; tight and loose or friction driving pulleys; leno motion with slackener bars; top beams and stands; beam locks; spring jacks; warp stop-motion.

Pulleys: 12″ or 14″ diameter by 2″ face.



Dobby Loom with Leno Motion

DOBBY LOOM

A very popular loom for weaving a wide range of coarse or fine fancy cotton goods is shown on the preceding page.

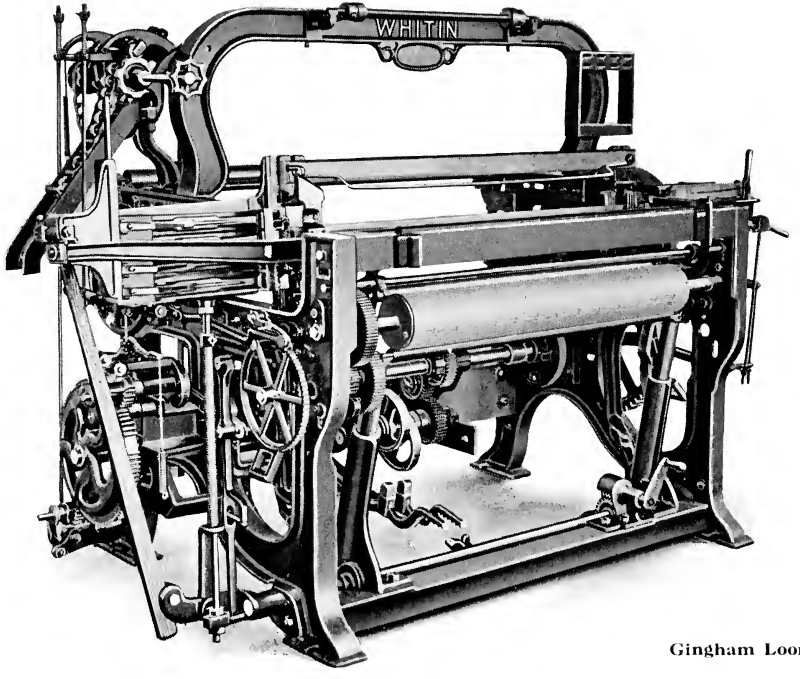
Motion is given to the dobby from the cam shaft by means of a connecting rod to the rocker arm, the pattern chain cylinder being actuated by a pawl and ratchet motion from the rocker arm.

A Leno Attachment, consisting of our patented jumper motion, two slackener bars and stands for four beams is applied.

Any of our various styles of **Cloth Roll** motions may be had, as desired. The one shown in the illustration is especially popular, on account of having a full roll capacity of 18 inches diameter. The high sand roll is advantageous as a means of reducing the wrinkling or shrinking of the cloth to a minimum, and also prevents, to a great extent, breakages in the warp by taking the strain off of the temples.

Optional Attachments: Tight and loose or friction driving pulleys; beam locks; spring jacks; pattern chain multiplier; warp stop-motion.

Pulleys: 12″ or 14″ diameter by 2″ face.



Gingham Loom

GINGHAM LOOM

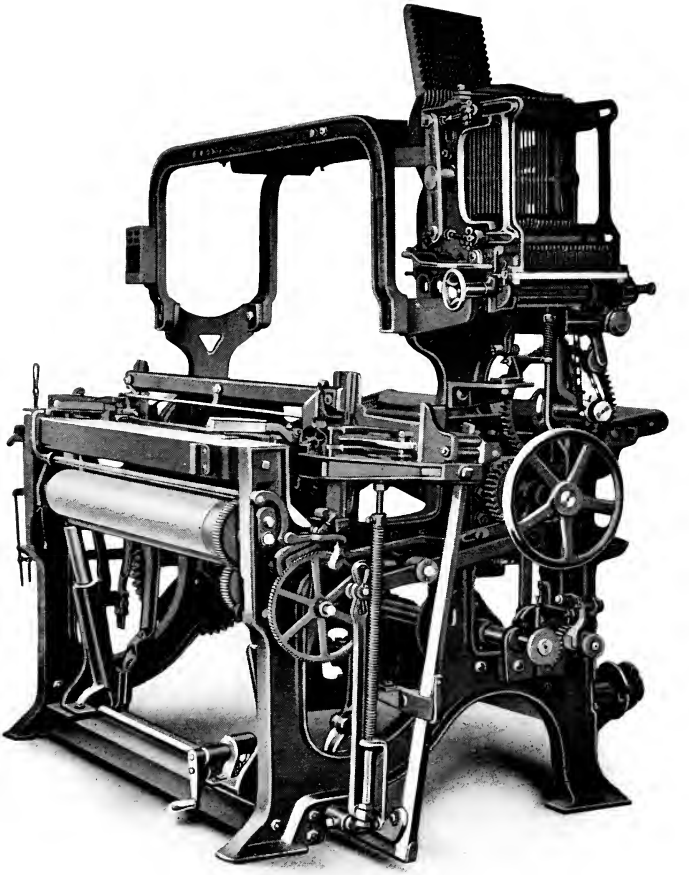
This loom is particularly adapted for weaving ginghams, cottonades and plaids, and is constructed with reference to weaving goods at the highest rate of speed consistent with quality desired. It is fitted with our ordinary harness cam motion, with auxiliary shaft, with which from two to six shed work may be woven.

The **Crompton Shuttle Box Motion** of four into one is used in combination with an efficient pattern chain mechanism. The pattern chain mechanism is so constructed that whenever the filling breaks, the motion of the chain is instantly arrested, and after the shuttle has been replaced and the loom restarted, the proper shuttle will be thrown without any adjustments of parts or loss of pick.

Our new **Chain Multiplier** used in combination with the box pattern chain is a great improvement over the old style disk multiplier on account of the ease in making up any desired combination.

The loom is fitted with our patented high-cloth-roll motion, friction let-off, or beam locks, and friction pulley.

Pulleys: 12″ or 14″ diameter, 2″ face.



Two Box Loom

TWO BOX LOOM

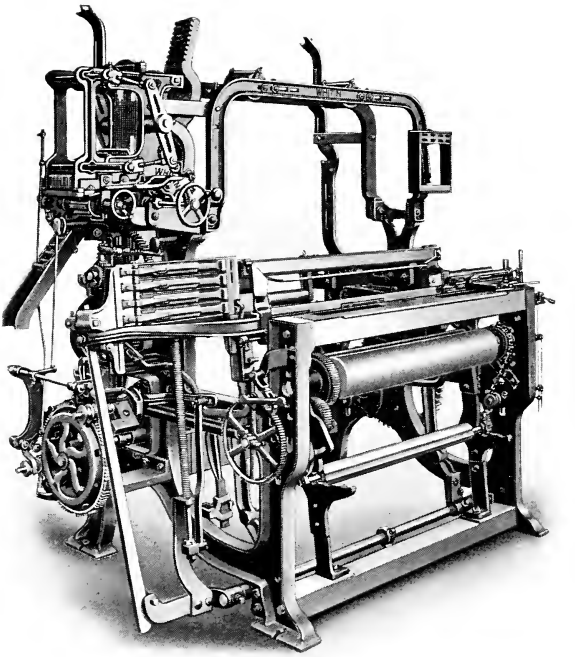
For weaving Handkerchiefs, Strips, etc.

By reference to the illustration, it will be noted that the construction of this loom is of a very simple nature, of very few parts, easily adjusted, and not liable to get out of repair.

The motion of the drop-boxes may be controlled either by a pattern chain mechanism, such as illustrated on page 25, or by means of pattern pegs acting in conjunction with the dobby pattern mechanism, as shown in the illustration on the preceding page.

This loom may be fitted with any of our different styles of cloth-roll and take-up motions, friction or Bartlett let-off motions, friction pulley, beam locks, spring jacks, and warp stop-motion.

Pulleys: 12″ and 14″ diameter, 2″ face.



Four Box Fancy Loom

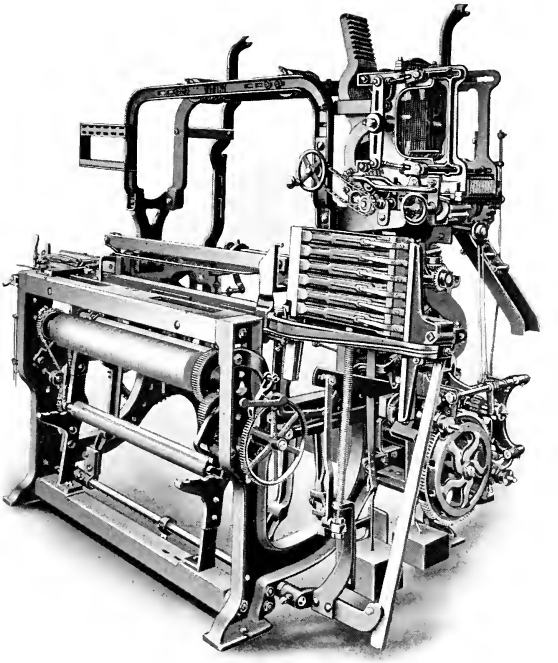
FOUR BOX FANCY LOOM

As will be seen by reference to the illustration on the preceding page, this loom is of a rugged and substantial design. The sides, girts and arches are of such proportions as to readily withstand any strains that might arise in weaving fancy goods of all kinds. **The Box Mechanism** bracket is rigidly bolted to the loom side, thus ensuring positive and accurate alignment of the shuttle boxes with the race plate.

The Dobby is firmly seated on a heavy bracket bolted to the arch extension, and added solidity is given it by being strongly braced to the arches.

The loom may be fitted with any of our different types of cloth-roll and take-up motions, Bartlett or friction let-offs; patented warp beam locks; friction pulley; box pattern chain multiplier; pattern chain controller; leno mechanism; spring jacks; warp stop-motion.

Pulleys: 12″ or 14″ diameter by 2″ face.



Six Box Fancy Loom

SIX BOX FANCY LOOM

This loom, as shown in the illustration on the preceding page, is similar in all respects to the four box loom, with the exception of the drop box and pattern chain mechanisms, being arranged for six boxes instead of four.

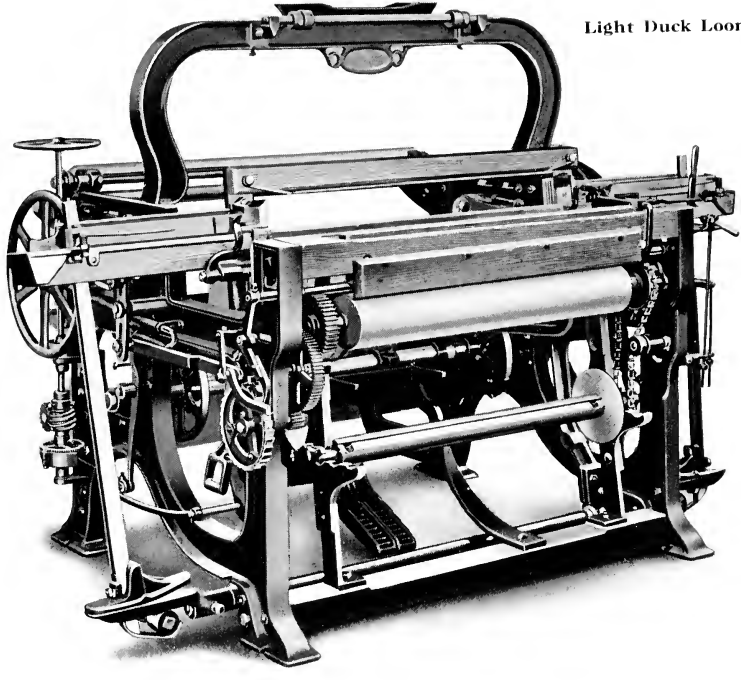
Pulleys: 12″ or 14″ diameter by 2″ face.

DUCK LOOMS

The manufacture of looms for weaving duck of all kinds, from the lightest sail duck to the heaviest belting duck, has been a specialty with us for several years. Owing to the extremely heavy nature of this class of goods the machinery for weaving them is of necessity much heavier in construction than is required for the ordinary grades of cloth.

We make four different types of looms for weaving duck: The Light, the Intermediate, the Medium and the Heavy Duck Looms. These looms are capable of weaving a wide range of goods of varying widths and weights.

The **Heavy Pattern Loom**, illustrated on page 16, is admirably adapted for weaving heavy osnaburgs and denims, flat duck up to 40", soft hose and belting duck up to 42", and Nos. 9 and 10 hard duck up to 42" wide. For heavier and wider duck use looms such as described on the following pages.



Light Duck Loom

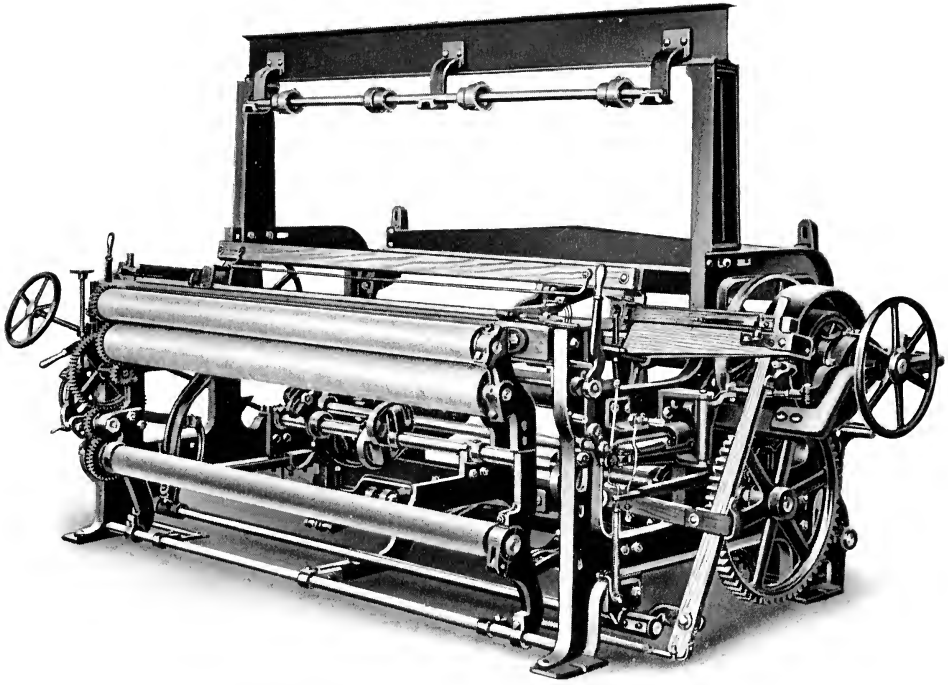
LIGHT DUCK LOOM

This loom is designed for weaving sail cloth, army duck and all light duck goods up to 32″ wide.

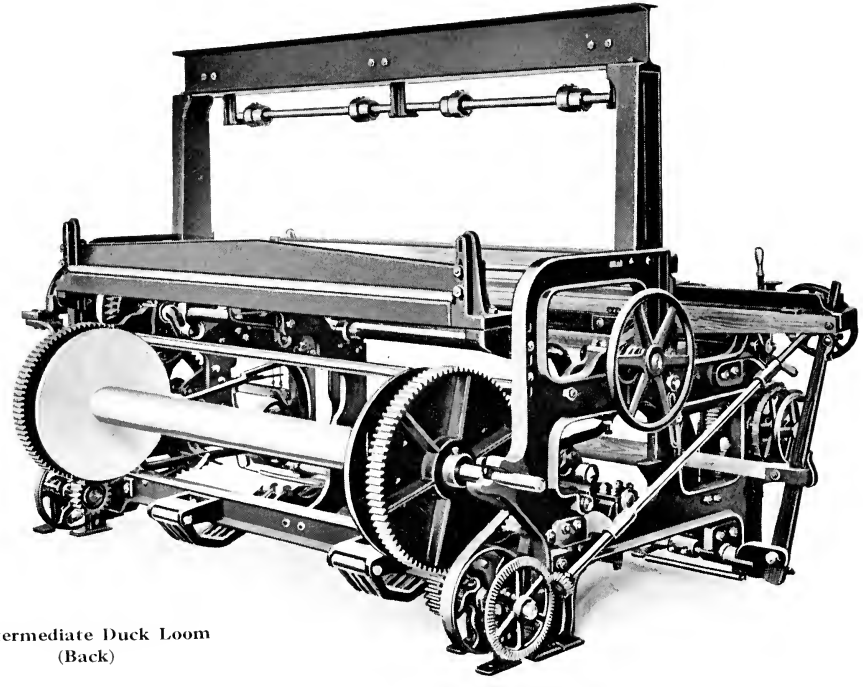
The general design of the frame and arch is similar to our Heavy Pattern Loom. Particular attention is called to the Bartlett let-off of very rugged design, and the high-cloth-roll motion, a combination which manufacturers will find is particularly adapted for light duck weaving. Changes in the number of picks being woven is readily accomplished by means of change ratchet gears.

The drive may be either by tight and loose pulleys or by friction, as preferred.

Pulleys: 14″ diameter by 3″ face.



Intermediate Duck Loom
(Front)



Intermediate Duck Loom
(Back)

INTERMEDIATE DUCK LOOM

This loom is designed for weaving light duck goods, such as sail cloth, army ducks and Nos. 7, 8, 9 and 10 hard duck up to 44" wide.

The Framing of this loom is especially strong and substantial in construction, and rigidly bolted together, thus producing a secure foundation for all the operative parts of the loom. The crank and cam shafts are proportionally heavy and have rugged bearings on each end and on sampsons.

The Lathe is made of tough, well seasoned lumber, and is fitted with steel race plates. The shuttle boxes are of iron with steel binders. The hand rail is of ash, re-enforced by a steel plate, and an efficient shuttle guard is applied thereon. The swords are of iron and swing on a heavy iron shaft rigidly hung to the frame. The pitmans are usually made of iron, but, if preferred, may be made of wood, provided with metal straps and regulating bolts, to take up the backlash in the pitman bearings.

The Harnesses are operated from the bottom shaft by means of two or more sets of cams and treadles, according to the width of the loom.

The Let-off motion may be a Bartlett of a friction device, the tension of which can be readily adjusted by the weaver at the front of the loom. A mechanism is also provided for reversing the warp beam. The warp tension bars are of rugged design, and simple adjusting means are provided for varying the tension on the warp yarn.

The Take-up Motion is positively driven from the crank shaft, giving a steady motion to the take-up rolls, thus ensuring even cloth. The take-up rolls are of iron, covered with steel filleting. The cloth roll is of wood, slidably mounted on a square iron shaft, which can be readily removed when the cloth roll is full.

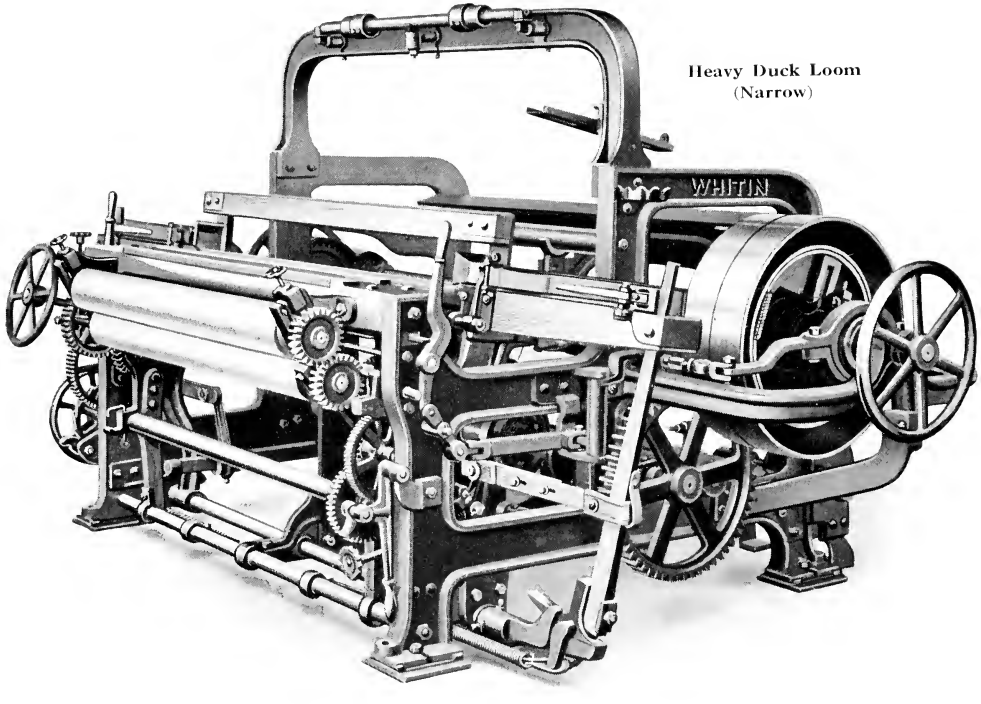
The Picking Motion is the well known "batwing" style, and is so designed as to give an easy, even pick on all widths of goods. The loom is driven by a **Friction Pulley,** 16" diameter by $4\frac{3}{4}$" face, on the crank shaft. A powerful **Brake Mechanism,** actuated from the shipper, is supplied as is also a very efficient brake relief.

MEDIUM DUCK LOOM

This loom is particularly adapted for weaving medium belting, heavy tent cloths and similar goods.

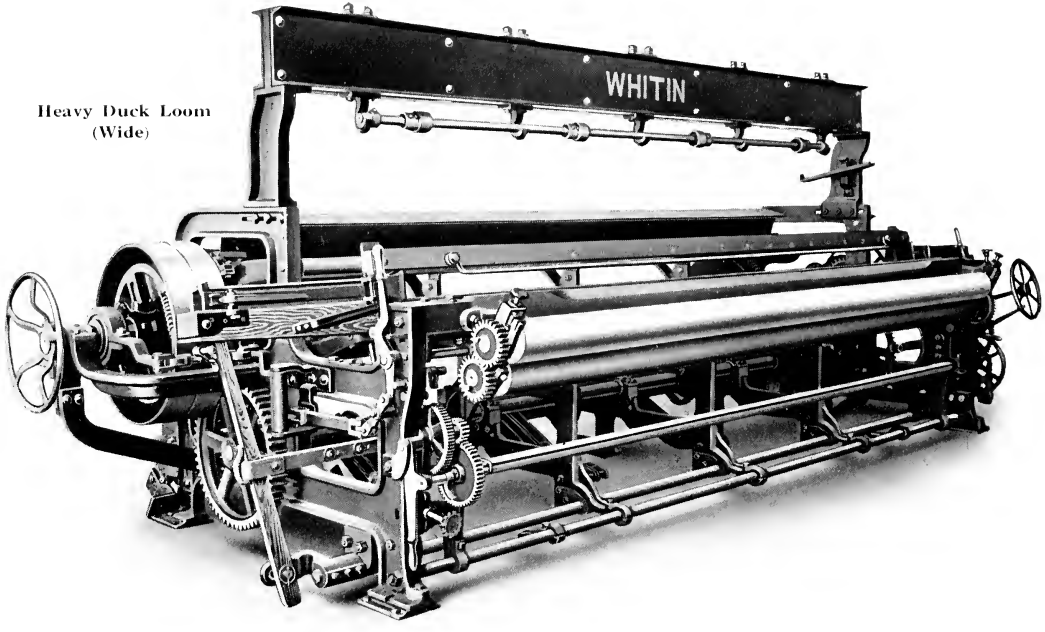
The construction is practically the same as that of our Heavy Duck Loom, with the exception of having a somewhat lighter design of warp tension bars, and a different arrangement for driving, the driving pulley being on the crank shaft instead of back geared. For further details, see description of the Heavy Duck Loom.

Pulleys: 24″ diameter by 8″ face.



Heavy Duck Loom
(Narrow)

Heavy Duck Loom
(Wide)



HEAVY DUCK LOOM

This loom is particularly adapted for weaving the following weights and widths of duck: Nos. 6 to 10, up to 176″ wide; No. 2 duck, up to 128″ wide; 4/0 hard duck up to 60″ wide; 8/0 hard duck up to 36″ to 40″ wide; and 12/0 hard duck up to 18″ to 20″ wide.

The General Construction of this loom is exceptionally heavy, especially in the wider patterns. All looms up to 82″ reed space have a heavy middle support or sampson providing additional supporting means for shafts and girts. Two or more sampsons are used on looms exceeding this width. To prevent deflection due to the heavy lift of the harnesses the arches on the wider widths of looms are made of heavy channel bars, as shown in illustration on the preceding page.

The Friction Driving Pulley, which is unusually heavy and substantial, transmits power to the loom through an auxiliary shaft, geared at each end to the crank shaft. This method of driving permits the use of a narrower belt than if the pulley was directly on the crank shaft, and also ensures a steady running loom.

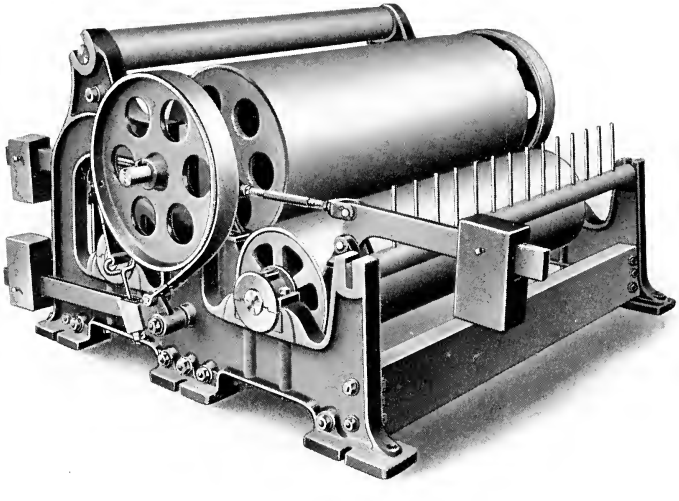
The Warp Beam is heavily constructed of a wrought-iron barrel, fitted with cast-iron heads of ample proportions. To provide for weaving goods of less width than the maximum reed space allows, the beams are fitted with adjustable heads.

The Let-off operates through friction due to band pulleys on shafts geared to the warp beam heads. By means of hand wheels at the front of the loom the friction on the beam can be adjusted and also released, thus allowing the beam to be reversed with a minimum amount of effort on the part of the weaver. The warp tension bars are extremely rugged in design and effectual in operation.

The Harnesses are operated from the bottom shaft by cams and treadles, two or more sets being used according to the width of the loom.

The Take-up is positively driven from the cam shaft, taking up every pick. It is fitted with fluted iron take-up rolls and an iron cloth roll, the cloth roll being located as low as possible to admit of winding a large roll of cloth.

The Driving Pulley is 24″ in diameter by 8″ face, and runs 2.23 revolutions to one of the crank shaft.

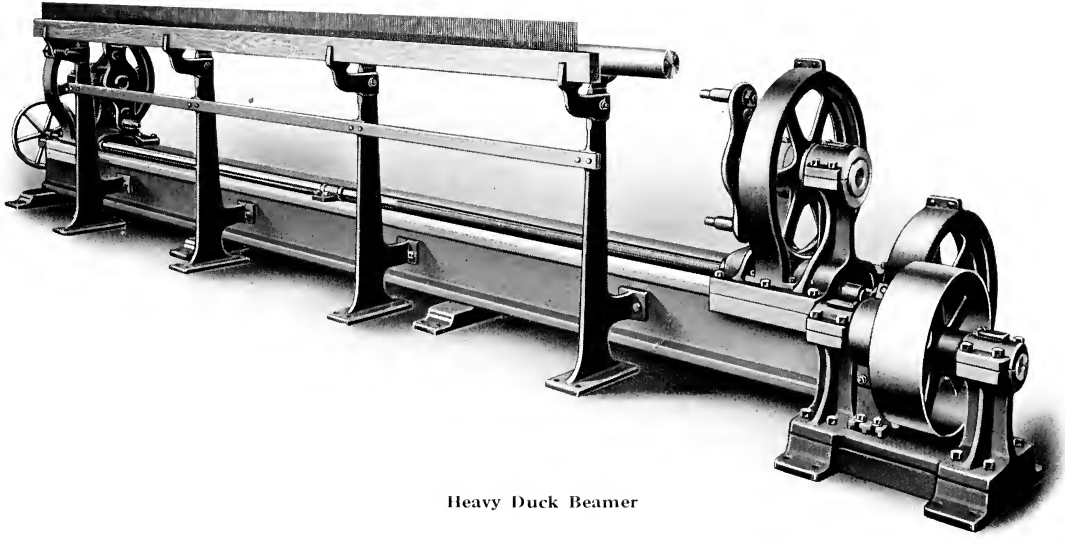


Extra Heavy Friction Rolls

EXTRA HEAVY FRICTION ROLLS

This machine is designed to impart any desired tension to the heaviest duck warps during the operation of beaming. The framing, rolls and bearings are made exceptionally heavy to withstand the heavy pull of the beaming machine. Friction is applied to the top roll by means of a friction pulley on each end of the roll shaft. The friction on the bottom rolls is varied by levers with adjustable weights acting in conjunction with brake shoes on the surfaces of the rolls.

Width of rolls 60″.



Heavy Duck Beamer

HEAVY DUCK BEAMER

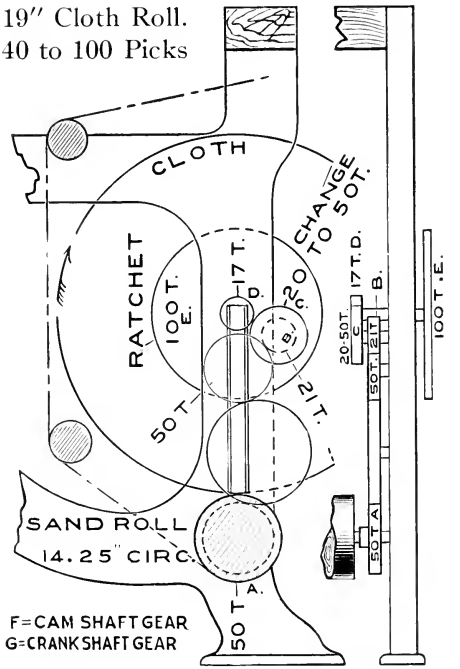
This machine is especially designed for beaming from chains or sectional beams, for the heaviest duck work that may be required. The yarn is drawn from the friction rolls through a reed, located at the back of the machine, by a heavily built driving mechanism. The head and foot beam stocks are readily adjusted to each other for different lengths of beams by means of a hand wheel fixed to a shaft which has a right and left screw thereon.

Pulleys: 18″ diameter by 6″ face.

☞ *The following pages contain diagrams illustrating common styles of* **Take-up Motions** *that may be applied to our Looms. Diagrams of other styles will be sent on application.*

Standard Model

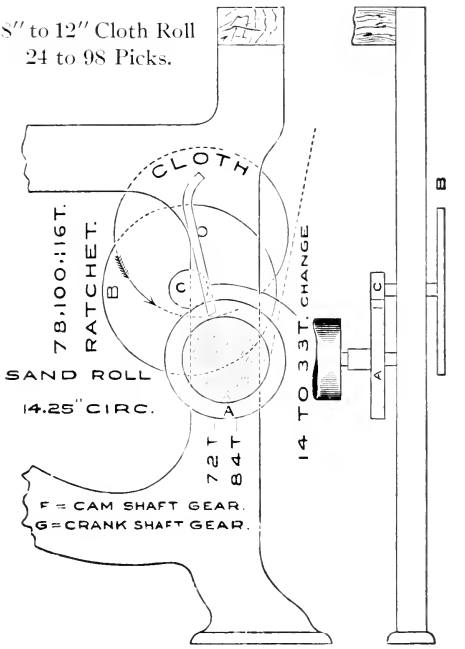
19″ Cloth Roll.
40 to 100 Picks



$$\frac{A. \times C. \times E. \times F}{B. \times D. \times 14.25 \times G} = \text{PICKS PER INCH.}$$

Change × 1.966 = Picks.
Picks ÷ 1.966 = Change.
Eccentric on Cam Shaft.

Old Model



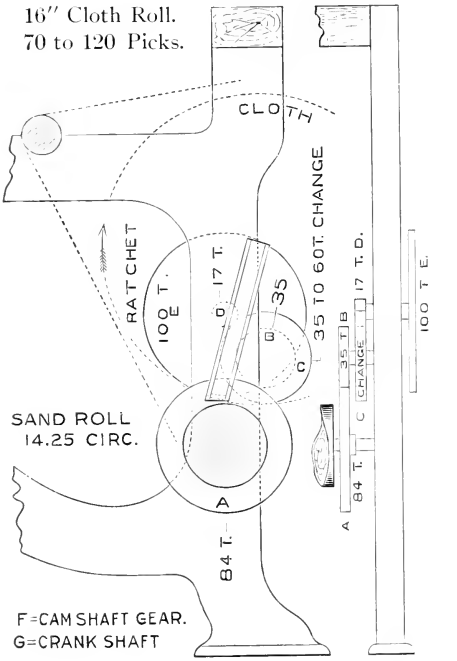
$$\frac{A. \times B. \times F.}{C. \times 14.25 \times G} = \text{PICKS PER INCH.}$$

CONSTANTS

A.	B.	CON	A.	B.	CON
72.	78	788	84	78	920
72.	100	1011	84	100	1179
72	116	1172	84	116	1363

Eccentric on Cam Shaft.
Constant ÷ Picks = Change.
Constant ÷ Change = Picks.

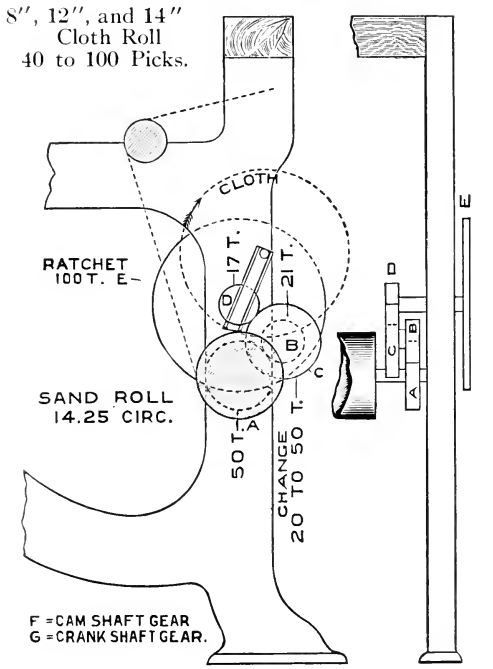
Newmarket Model



$$\frac{A \times C \times E \times F}{B \times D \times 14.25 \times G} = \text{PICKS PER INCH}$$

Change $\times$ 1.981 = Picks.
Picks $\div$ 1.981 = Change.
Eccentric on Cam Shaft.

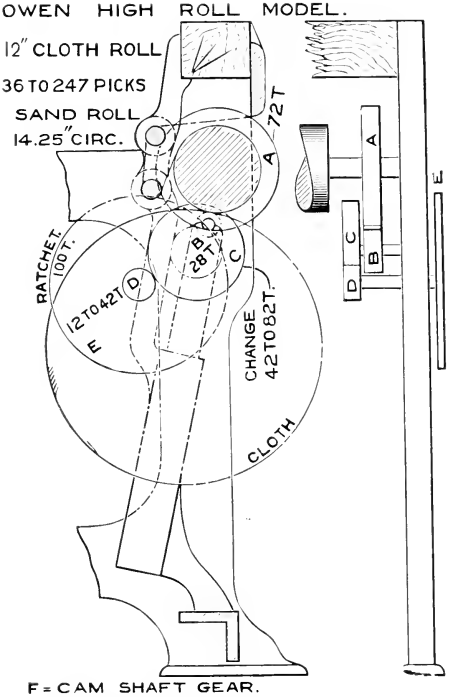
Standard Model



$$\frac{A.X\ C.X\ E.X\ F.}{B.X\ D.X14.25XG.} = \text{PICKS PER INCH.}$$

Change $\times$ 1.966 = Picks.
Picks $\div$ 1.966 = Change.
Eccentric on Cam Shaft.

OWEN HIGH ROLL MODEL.



F = CAM SHAFT GEAR.
G = CRANK SHAFT GEAR.

ECCENTRIC ON CAM SHAFT.

$$\frac{A \times C \times E \times F}{B \times D \times 14.25 \times G} = \text{PICKS PER INCH.}$$

RULES FOR WEAVERS

To find the width of reed:

Multiply desired width of cloth by 16 and divide product by 15.

To find the width of harness:

Multiply the desired width of cloth by 14 and divide product by 13.

To find the width of cloth that when bleached will be a given width:

Multiply the given width by 14 and divide the product by 13.

To find the theoretical production of a loom per day of ten hours:

Dividing the revolutions of the crank shaft (or picks) made in ten hours by the product of the picks per inch of weft and number of inches in a yard gives the yards produced in ten hours. This result divided by the number of yards in a pound gives the pounds produced in one day of ten hours.

To find the average number of yarn in any cloth:

Add together the picks per inch of warp and of filling and divide this sum by the sum of the quotients of the picks of warp divided by the number of warp and the picks of filling divided by the number of the filling.

Example.—What is the average number of yarn in a piece of cloth woven from 29s warp and 35s filling with 80 picks per inch warp and 76 picks filling?

SOLUTION. $80 + 76 = 156$; $80 \div 29 = 2.76$; $76 \div 35 = 2.17$; $2.76 + 2.17 = 4.93$; $156 \div 4.93 = 31.65$ average yarn.

To find the average number of yarn required to produce cloth of any desired weight, width and pick:

Add together the number of picks per inch of warp and filling; multiply their sum by the yards of cloth per pound, and this product

by its width in inches; divide by 840, and the quotient will be the average number of yarn required. For any increase in weight due to sizing, proportional allowance must be made in the yarn. An allowance for contraction of from 7% to 10% according to the quality of goods should be made.

Example.—What is the average number of yarn required to produce 7 yard goods, 28″ wide, and 64 × 64 picks, allowing 10% for contraction?

SOLUTION. 64 + 64 = 128; 128 × 7 × 28 = 25088; 840—10% = 756; 25088 ÷ 756 = 33.18 average yarn.

To find the weight of cloth or number of yards per pound:

Dividing the product of the average number of yarn multiplied by 840 less a percentage for contraction, by the product of the sum of the picks per inch of warp and filling and the width of the cloth in inches gives the number of yards in a pound.

Example.—What is the number of yards per pound of goods 96 × 100, 39½″ wide, average yarn 33s ?

SOLUTION. 840 — 10% = 756, 756 × 33 = 24948; 96 + 100 = 196; 196 × 39½ = 7742, 24948 ÷ 7742 = 3.22 yards per pound.

To find the approximate percentage of warp or filling in cloth when counts and numbers of yarn are known:

Let a = warp counts per inch
" b = filling " " "
" w = number of warp yarn
" f = " " filling "

then $\frac{af}{af + bw}$ = per cent of warp.

" $\frac{bw}{af + bw}$ = per cent of filling.

Example.—What is the per cent of warp in a yard of cloth 96 × 100, made of 28s warp and 36s filling?

a = 96; b = 100; w = 28; f = 36; af = 96 × 36 = 3456; bw = 100 × 28 = 2800; af + bw = 3456 + 2800 = 6256; 3456 ÷ 6256 = .55 or 55% warp.

To find the percentage of warp or filling in any width of cloth when weight of cloth, counts and numbers of yarn are known:

Multiply width in inches by picks per inch of warp by yards per pound. Dividing the product by the product of 840, less a suitable percentage for contraction, by the number of warp yarn, and the result is the percentage of warp in the cloth.

Example.—What is the percentage of warp in 3.22 yard goods, 96 × 100, 39½″ wide, 28s warp, 36s filling?

SOLUTION. 39.5 × 96 × 3.22 = 12210.24; 840 — 10% = 756; 756 × 28 = 21168; 12210.24 ÷ 21168 = 57% warp in cloth. 100 — 57 = 43% filling in cloth.

To find the number of teeth in change gear required to give any desired number of picks per inch:

We have many different combinations of pick gearing (see page 66), but the same general rule for calculating the pick gear applies to all, the circumference of the sand roll being always considered as a driver.

On looms taking up on alternate picks by means of a pawl and ratchet, actuated by an eccentric on the cam shaft, the number of teeth in ratchet should be multiplied by 2. On looms taking up every pick, figure with the exact number of teeth in ratchet.

When the change gear is a driven:

Rule.—Multiply the required number of picks by the number of teeth of each driving gear, by the circumference of the sand roll in inches for a dividend; multiply the number of teeth of each driven gear together for a divisor. Divide the dividend by the divisor, and the quotient will be the number of teeth in the change gear.

Example.—What change gear will be required to give 36 picks on a loom with the Owen High Cloth Roll (see diagram page 71) having a 100 teeth ratchet, 42 teeth pinion, 28 teeth stud, 72 teeth sand roll gear, circumference of sand roll 14.25″, taking up on alternate picks?

SOLUTION. $\frac{36 \times 42 \times 28 \times 14.25}{100 \times 2 \times 72} = 41.895$ or approximately 42 teeth change gear.

When the change gear is a driver:

Rule.—Multiply the number of teeth of the driven gears together for a dividend; multiply the circumference of the sand roll in inches by the number of picks required by the driving gears for a divisor. Divide the dividend by the divisor, and the quotient will be the number of teeth in the change gear.

Example.—What change gear will be required to give 36 picks on a loom with "old model" take-up (see diagram page 68) having 100 teeth ratchet, 72 teeth sand roll gear, circumference of sand roll 14.25", taking up on alternate picks?

SOLUTION. $\frac{100 \times 2 \times 72}{14.25 \times 36} = 28$ teeth change gear.

To find the pick constant of a loom:

Multiply the driven gears together, and divide by the drivers and circumference in inches of the sand roll, omitting the change gear and picks per inch from the calculation.

When the change gear is a driver, dividing the constant by the number of picks gives the change gear.

When the change gear is a driven, dividing the picks required by the constant gives the change gear.

Example.—What is the pick constant for "old model" take-up (shown on page 68) with 72 teeth sand roll gear, 100 teeth ratchet?

SOLUTION. $\frac{200 \times 72}{14.25} = 1011$ constant.

The change gear being a driver, therefore 1011 ÷ picks = change gear.

Speeds of

Whitin Looms on Medium Weight Cloth.

Name of Loom.	Revolutions per minute.	Name of Loom.	Revolutions per minute.
28 in.	200 to 210	72 in.	116 to 120
30	195 " 200	74	114 " 116
31	190 " 195	79	112 " 114
32	185 " 190	80	110 " 112
34	180 " 185	81	108 " 110
36	175 " 180	82	106 " 108
38	170 " 175	88	104 " 106
40	165 " 170	90	102 " 104
42	160 " 165	92	100 " 102
44	154 " 158	98	98 " 100
46	150 " 154	99	96 " 98
50	142 " 148	100	94 " 96
54	140 " 144	101	92 " 94
56	138 " 140	107	88 " 90
60	132 " 136	108	86 " 88
66	126 " 130	124	75 " 80
70	120 " 124	150	65 " 70

Table showing the number of yards of Cloth produced in one day of 10 hours.

Revolutions of Crank Shaft per Minute.

Picks per Inch.	100 YDS	110 YDS	120 YDS	130 YDS	140 YDS	150 YDS	155 YDS	160 YDS	165 YDS	170 YDS	175 YDS	180 YDS	185 YDS	190 YDS	195 YDS	200 YDS	210 YDS	Picks per Inch.
30	50.0	55.0	60.0	65.0	70.0	75.0	77.5	80.0	82.5	85.0	87.5	90.0	92.5	95.0	97.5	100.0	105.0	30
32	46.9	51.6	56.3	60.9	65.6	70.3	72.7	75.0	77.3	79.7	82.0	84.4	86.7	89.1	91.4	93.8	98.4	32
36	41.7	45.8	50.0	54.2	58.3	62.5	64.6	66.7	68.8	70.8	72.9	75.0	77.1	79.2	81.3	83.3	87.5	36
40	37.5	41.3	45.0	48.8	52.5	56.3	58.1	60.0	61.9	63.8	65.6	67.5	69.4	71.3	73.1	75.0	78.8	40
42	35.7	39.3	42.9	46.4	50.0	53.6	55.4	57.1	58.9	60.7	62.5	64.3	66.0	67.9	69.6	71.4	75.0	42
44	34.1	37.5	40.9	44.3	47.7	51.1	52.8	54.5	56.3	58.0	59.7	61.4	63.1	64.8	66.5	68.2	71.6	44
46	32.6	35.9	39.1	42.4	45.7	48.9	50.5	52.2	53.8	55.4	57.1	58.7	60.3	62.0	63.6	65.2	68.5	46
48	31.3	34.4	37.5	40.6	43.8	46.9	48.4	50.0	51.6	53.1	54.7	56.3	57.8	59.4	60.9	62.5	65.6	48
50	30.0	33.0	36.0	39.0	42.0	45.0	46.5	48.0	49.5	51.0	52.5	54.0	55.5	57.0	58.5	60.0	63.0	50
52	28.8	31.7	34.6	37.5	40.4	43.3	44.7	46.2	47.6	49.0	50.5	51.9	53.4	54.8	56.3	57.7	60.6	52
54	27.8	30.6	33.3	36.1	38.9	41.7	43.1	44.4	45.8	47.2	48.6	50.0	51.4	52.8	54.2	55.6	58.3	54
56	26.8	29.5	32.1	34.8	37.5	40.2	41.5	42.9	44.2	45.5	46.9	48.2	49.6	50.9	52.2	53.6	56.3	56
58	25.9	28.4	31.0	33.6	36.2	38.8	40.1	41.4	42.7	44.0	45.3	46.6	47.8	49.1	50.4	51.7	54.3	58
60	25.0	27.5	30.0	32.5	35.0	37.5	38.8	40.0	41.3	42.5	43.8	45.0	46.3	47.5	48.8	50.0	52.5	60
62	24.2	26.6	29.0	31.5	33.9	36.3	37.5	38.7	39.9	41.1	42.3	43.5	44.8	46.0	47.2	48.4	50.8	62
64	23.4	25.8	28.1	30.5	32.8	35.2	36.3	37.5	38.7	39.8	41.0	42.2	43.4	44.5	45.7	46.9	49.2	64
66	22.7	25.0	27.3	29.5	31.8	34.1	35.2	36.4	37.5	38.6	39.8	40.9	42.0	43.2	44.3	45.5	47.7	66
68	22.1	24.3	26.5	28.7	30.9	33.1	34.2	35.3	36.4	37.5	38.6	39.7	40.8	41.9	43.0	44.1	46.3	68
70	21.4	23.6	25.7	27.9	30.0	32.2	33.2	34.3	35.4	36.4	37.5	38.6	39.6	40.7	41.8	42.9	45.0	70
72	20.8	22.9	25.0	27.1	29.2	31.3	32.3	33.3	34.4	35.4	36.5	37.5	38.5	39.6	40.6	41.7	43.7	72

NOTE:—In the above tables, 10 per cent. of the time is allowed for changing shuttle, cleaning, oiling, etc.

The Whitin Loom. Continued.

Table showing the number of yards of Cloth produced in one day of 10 hours.

Picks per Inch.	Revolutions of Crank Shaft per Minute.																	Picks per Inch.
	100	110	120	130	140	150	155	160	165	170	175	180	185	190	195	200	210	
	YDS	YDS	YDS	YDS	YDS	YDS	YDS	YDS	YDS	YDS	YDS	YDS	YDS	YDS	YDS	YDS	YDS	
74	20.3	22.3	24.3	26.4	28.4	30.4	31.4	32.4	33.4	34.5	35.5	36.5	37.5	38.5	39.5	40.5	42.6	74
76	19.7	21.7	23.7	25.7	27.6	29.6	30.6	31.6	32.6	33.6	34.5	35.5	36.5	37.5	38.5	39.5	41.4	76
78	19.2	21.2	23.1	25.0	26.9	28.8	29.8	30.8	31.7	32.7	33.7	34.6	35.6	36.5	37.5	38.5	40.4	78
80	18.8	20.6	22.5	24.4	26.3	28.1	29.1	30.0	30.9	31.9	32.8	33.8	34.7	35.6	36.6	37.5	39.4	80
82	18.3	20.1	22.0	23.8	25.6	27.4	28.4	29.3	30.2	31.1	32.0	32.9	33.8	34.8	35.7	36.6	38.4	82
84	17.9	19.6	21.4	23.2	25.0	26.8	27.7	28.6	29.5	30.4	31.3	32.1	33.0	33.9	34.8	35.7	37.5	84
86	17.4	19.2	20.9	22.7	24.4	26.2	27.0	27.9	28.8	29.7	30.5	31.4	32.3	33.1	34.0	34.9	36.6	86
88	17.0	18.8	20.5	22.2	23.9	25.6	26.4	27.3	28.1	29.0	29.8	30.7	31.5	32.4	33.2	34.1	35.8	88
90	16.7	18.3	20.0	21.7	23.3	25.0	25.8	26.7	27.5	28.3	29.2	30.0	30.8	31.7	32.5	33.3	35.0	90
92	16.3	17.9	19.6	21.2	22.8	24.5	25.3	26.1	26.9	27.7	28.5	29.3	30.2	31.0	31.8	32.6	34.2	92
94	16.0	17.6	19.1	20.7	22.3	23.9	24.7	25.5	26.3	27.1	27.9	28.7	29.5	30.3	31.1	31.9	33.5	94
96	15.6	17.2	18.8	20.3	21.9	23.4	24.2	25.0	25.8	26.6	27.3	28.1	28.9	29.7	30.5	31.3	32.8	96
98	15.3	16.8	18.4	19.9	21.4	23.0	23.7	24.5	25.3	26.0	26.8	27.6	28.3	29.1	29.8	30.6	32.1	98
100	15.0	16.5	18.0	19.5	21.0	22.5	23.3	24.0	24.8	25.5	26.3	27.0	27.8	28.5	29.3	30.0	31.5	100
102	14.7	16.2	17.6	19.1	20.6	22.1	22.8	23.5	24.3	25.0	25.7	26.5	27.2	27.9	28.7	29.4	30.9	102
104	14.4	15.9	17.3	18.8	20.2	21.6	22.4	23.1	23.8	24.5	25.2	26.0	26.7	27.4	28.1	28.8	30.3	104
106	14.2	15.6	17.0	18.4	19.8	21.2	21.9	22.6	23.3	24.1	24.8	25.5	26.2	26.9	27.6	28.3	29.7	106
108	13.9	15.3	16.7	18.1	19.4	20.8	21.5	22 2	22.9	23.6	24.3	25.0	25.7	26.4	27.1	27.8	29.2	108
110	13.6	15.0	16.4	17.7	19.1	20.5	21.1	21.8	22.5	23.2	23.9	24.5	25.2	25.9	26.6	27.3	28.6	110
112	13.4	14.7	16.1	17.4	18.8	20.1	20.8	21.4	22.1	22.8	23.4	24.1	24.8	25.4	26.1	26.8	28.1	112

NOTE:—In the above tables, 10 per cent. of the time is allowed for changing shuttle, cleaning, oiling, etc.

The Whitin Loom. Continued.

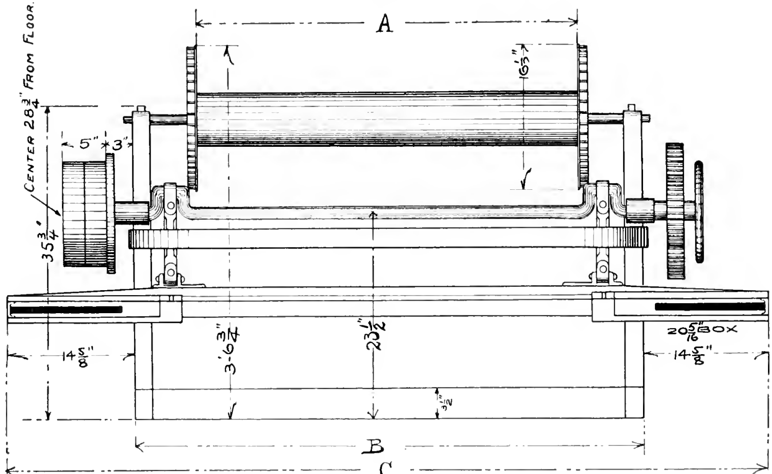
Table showing the number of yards of Cloth produced in one day of 10 hours.

Revolutions of Crank Shaft per Minute.

Picks per Inch.	100 YDS	110 YDS	120 YDS	130 YDS.	140 YDS	150 YDS	155 YDS	160 YDS	165 YDS	170 YDS	175 YDS	180 YDS	185 YDS	190 YDS	195 YDS	200 YDS	210 YDS	Picks per Inch.
114	13.2	14.5	15.8	17.1	18.4	19.7	20.4	21.1	21.7	22.4	23.0	23.7	24.3	25.0	25.7	26.3	27.6	114
116	12.9	14.2	15.5	16.8	18.1	19.4	20.0	20.7	21.3	22.0	22.6	23.3	23.9	24.6	25.2	25.9	27.2	116
118	12.7	14.0	15.3	16.5	17.8	19.1	19.7	20.3	21.0	21.6	22.2	22.9	23.5	24.2	24.8	25.4	26.7	118
120	12.5	13.8	15.0	16.3	17.5	18.8	19.4	20.0	20.6	21.3	21.9	22.5	23.1	23.8	24.4	25.0	26.3	120
122	12.3	13.5	14.8	16.0	17.2	18.4	19.1	19.7	20.3	20.9	21.5	22.1	22.7	23.4	24.0	24.6	25.8	122
124	12.1	13.3	14.5	15.7	16.9	18.1	18.8	19.4	20.0	20.6	21.2	21.8	22.4	23.0	23.6	24.2	25.4	124
126	11.9	13.1	14.3	15.5	16.7	17.9	18.5	19.0	19.6	20.2	20.8	21.4	22.0	22.6	23.2	23.8	25.0	126
128	11.7	12.9	14.1	15.2	16.4	17.6	18.2	18.8	19.3	19.9	20.5	21.1	21.7	22.3	22.9	23.4	24.6	128
130	11.5	12.7	13.8	15.0	16.2	17.3	17.9	18.5	19.0	19.6	20.2	20.8	21.3	21.9	22.5	23.1	24.2	130
132	11.4	12.5	13.6	14.8	15.9	17.0	17.6	18.2	18.8	19.3	19.9	20.5	21.0	21.6	22.2	22.7	23.9	132
134	11.2	12.3	13.4	14.6	15.7	16.8	17 4	17.9	18.5	19.0	19.6	20.1	20.7	21.3	21.8	22.4	23.5	134
136	11.0	12.1	13.2	14,3	15.4	16.5	17.1	17.6	18.2	18.8	19.3	19.9	20.4	21.0	21.5	22.1	23.2	136
138	10.9	12.0	13.0	14.1	15.2	16.3	16.8	17.4	17.9	18.5	19.0	19.6	20.1	20.7	21.2	21.7	22.8	138
140	10.7	11.8	12.9	13.9	15.0	16.1	16.6	17.1	17.7	18.2	18.8	19.3	19.8	20.4	20.9	21.4	22.5	140
142	10.6	11.6	12.7	13.7	14.8	15.8	16.4	16.9	17.4	18.0	18.5	19.0	19.5	20.1	20.6	21.1	22.2	142
144	10.4	11.5	12.5	13.5	14.6	15.6	16.1	16.7	17.2	17.7	18.2	18.8	19.3	19.8	20.3	20.8	21.9	144
146	10.3	11.3	12.3	13.4	14.4	15.4	15.9	16.4	17.0	17.5	18.0	18.5	19.0	19.5	20.0	20.5	21.6	146
148	10.1	11.1	12.2	13.2	14.2	15.2	15.7	16.2	16.7	17.2	17.7	18.2	18.8	19.3	19.8	20.3	21.3	148
150	10.0	11.0	12.0	13.0	14.0	15.0	15.5	16.0	16.5	17.0	17.5	18.0	18.5	19.0	19.5	20.0	21.0	150

NOTE:—In the above tables, 10 per cent. of the time is allowed for changing shuttle, cleaning, oiling, etc.

Floor Plan of Standard Looms



The Whitin Standard Looms

Names of Looms	24″	25″	28″	30″	31″	32″	33″	34″	36″	37″	38″
A	28″	29″	32″	34″	35″	36″	37″	38″	40″	41″	42″
B	41 3/8″	43 3/8″	46 3/8″	47 7/8″	49 3/8″	50 3/8″	51 3/8″	52 3/8″	54 3/8″	55 3/8″	56 3/8″
C	71 5/8″	72 5/8″	75 5/8″	77 1/8″	78 5/8″	79 5/8″	80 5/8″	81 5/8″	83 5/8″	84 5/8″	85 5/8″

Names of Looms	40″	41″	42″	44″	45″	46″	48″	50″	52″	54″	56″
A	44″	45″	46″	48″	49″	50″	52″	54″	56″	58″	60″
B	58 3/8″	59 3/8″	60 3/8″	62 3/8″	63 3/8″	64 3/8″	66 3/8″	68 3/8″	70 7/8″	72 7/8″	74 7/8″
C	87 5/8″	88 5/8″	89 5/8″	91 5/8″	92 5/8″	93 5/8″	95 5/8″	97 5/8″	100 1/4″	102 1/8″	104 1/8″

Names of Looms	60″	64″	66″	70″	72″	74″	79″	80″	81″	82″
A	64″	68″	70″	74″	76″	78″	83″	84″	85″	86″
B	79 3/8″	83 3/8″	85 3/8″	89 3/8″	94 1/4″	105″	110″	111″	112″	114″
C	108 5/8″	112 5/8″	114 5/8″	118 5/8″	124″	127″	132″	133″	134″	136″

Names of Looms	88″	90″	92″	98″	99″	100″	101″	107″	108″	124″	150″
A	92″	94″	96″	102″	103″	104″	105″	111″	112″	128″	154″
B	120″	122″	124″	130″	131″	132″	133″	140″	142″	158″	190″
C	142″	144″	146″	152″	153″	154″	155″	162″	164″	180″	212″

Table of Floor Space Required for The Standard Whitin Looms

Name of Loom	Length of Lay		Width outside Breast Beam to outside 16½" Warp Beam		Distance between Swords	Reed Space
	Feet	Inches	Feet	Inches	Inches	Inches
24 in.	5	11 5/8	3	6 3/4	31	29½
25	6	0 3/8	3	6 3/4	32	30½
28	6	3 5/8	3	6 3/4	35	33½
30	6	5 1/8	3	6 3/4	36½	35
31	6	6 3/8	3	6 3/4	38	36½
32	6	7 5/8	3	6 3/4	39	37½
33	6	8 5/8	3	6 3/4	40	38½
34	6	9 5/8	3	6 3/4	41	39½
36	6	11 5/8	3	6 3/4	43	41½
37	7	0 5/8	3	6 3/4	44	42½
38	7	1 5/8	3	6 3/4	45	43½
40	7	3 5/8	3	6 3/4	47	45½
41	7	4 5/8	3	6 3/4	48	46½
42	7	5 5/8	3	6 3/4	49	47½
44	7	7 5/8	3	6 3/4	51	49½
45	7	8 5/8	3	6 3/4	52	50½
46	7	9 5/8	3	6 3/4	53	51½
48	7	11 5/8	3	6 3/4	55	53½
50	8	1 5/8	3	6 3/4	57	55½
52	8	4 1/8	3	6 3/4	59½	58
54	8	6 1/8	3	6 3/4	61½	60
56	8	8 1/8	3	6 3/4	63½	62
60	9	0 3/8	3	6 3/4	68	66½
64	9	4 3/8	3	6 3/4	72	70½
66	9	6 3/8	3	6 3/4	74	72½
70	9	10 3/8	3	6 3/4	78	76½
72	10	4	3	11 3/4	80	78½
74	10	7	3	11 3/4	83	81½
79	11	0	3	11 3/4	88	86½
80	11	1	3	11 3/4	89	87½
81	11	2	3	11 3/4	90	88½
82	11	4	3	11 3/4	92	90½
88	11	10	3	11 3/4	98	96½
90	12	0	3	11 3/4	100	98½
92	12	2	3	11 3/4	102	100½
98	12	8	3	11 3/4	108	106½
99	12	9	3	11 3/4	109	107½
100	12	10	3	11 3/4	110	108½
101	12	11	3	11 3/4	111	109½
107	13	6	3	11 3/4	118	116½
108	13	8	3	11 3/4	120	118½
124	15	0	3	11 3/4	136	134½
150	17	8	3	11 3/4	164	162½

Note.—The above table has for its basis our regular standard 40" heavy pattern loom. The name of loom is so given for convenience, as the number of inches given is not intended to indicate the exact width of cloth, as this will vary according to quality of cotton used, number of picks, and number of yarn, etc. In the list above, 24" to 72" looms, inclusive, have shuttle boxes 20 5/8" long, which is a suitable length for 15" shuttles. From 72" upwards, a 22" to 26" box is used. We make boxes 18" to 26" long, and when variations are made from standard size, there will be a corresponding variation in the length of lathe.

Repairs.

We have issued for the convenience of users of our machinery, **Illustrated Circulars of the Component Parts** of each machine which we build. The various pieces are illustrated in a clear manner, numbered and named, so that if the directions for ordering repairs, as stated in circulars, are followed there will be no doubt but what the orders will be correctly filled, with the least possible delay. Copies of these circulars have been sent to all our customers, and extra copies will be sent on application.

The Hands of Machines.

To determine the **Hands** of our **Machines,** face the delivery and note which hand side the driving pulleys are.

Shipping Directions.

We prefer our customers to furnish directions for shipping their orders, but if not given and the package is small, we send by express, if large by freight, selecting the most reliable routes and the lowest freight rates that can be secured.